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Module 7

Evaluating Water Quality Compliance

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Content

7a. Evaluating On-site Compliance

- Complex Treatment Trains
- Redevelopment

7b. BMP Variations

- Online vs Offline Practices
- Specifications

7c. Off-site Compliance Options

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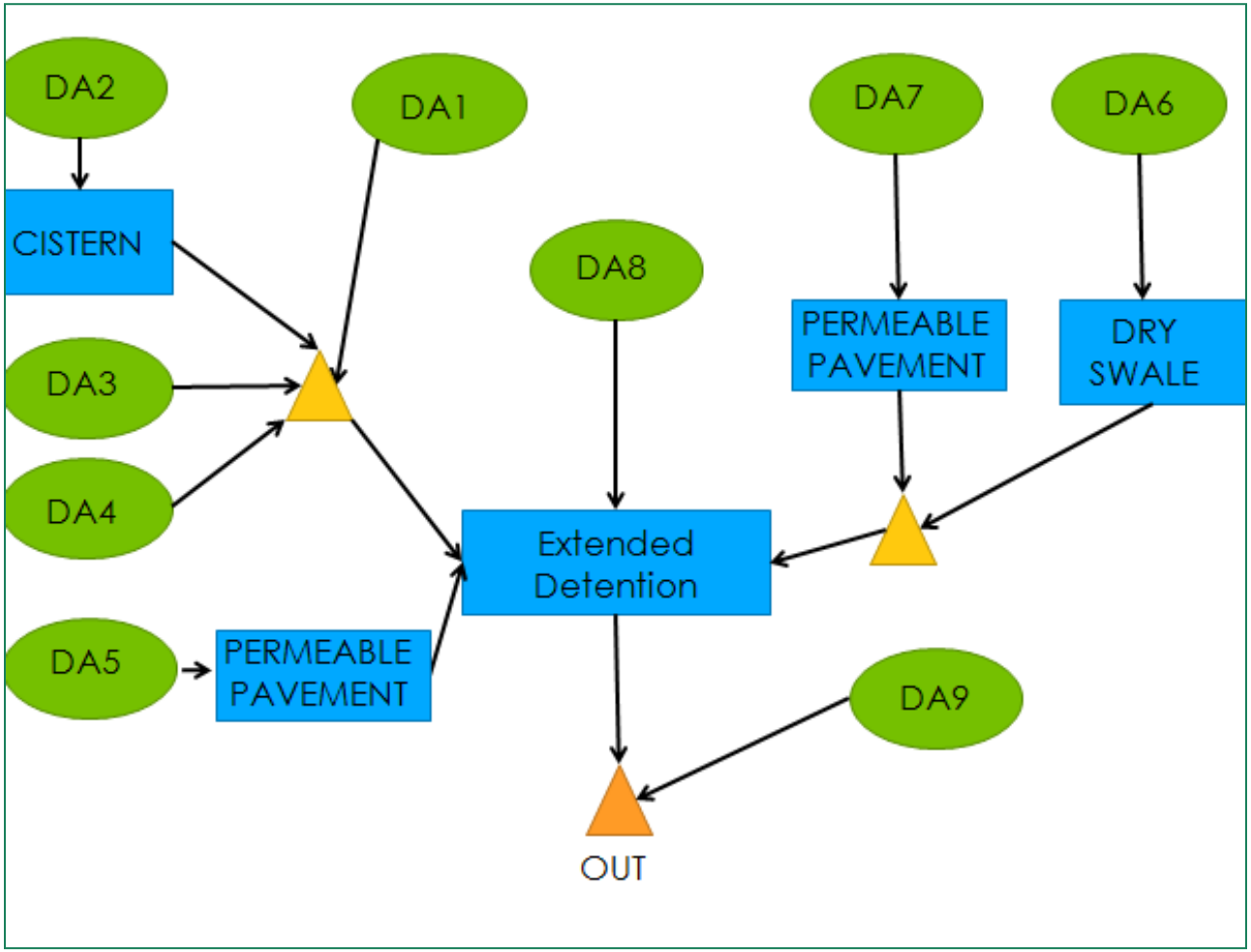
7a2. Complex Treatment Trains



What is important to track?

Volume

<u>and</u> Load

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Variables to Account for:

- Hydrologic Parameters
  - **Land Cover**: Forest – Turf - Impervious
  - **HSG:** A – B – C - D
- Volume and Load
  - Tracked for **Each Sub-area** and for **Each Practice**
  - Volume to next practice includes **residual volume** from U/S BMP **plus direct volume**
  - Load includes **residual load and direct load**
  - Don't forget **bypass loads**

Volume Tracking

Drainage Area B

Drainage Area B Land Cover (acre

	D Soils	Totals	Land Cover Rv
Forest/Open Space (acres)	0.00	0.00	0.00
Managed Turf (acres)	0.00	1.00	0.22
Impervious Cover (acres)	0.00	1.00	0.95
	Total	2.00	

Post Development Treatment Volume (cf) 4247

Apply Runoff Reduction ent Volume & Post-Development Load in Drainage Area B

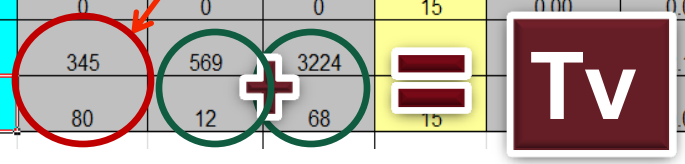
Practice	on of Credit	Credit	Credit Area (acres)	Volume from Upstream RR Practice (cf)	Runoff Reduction (cf)	Remaining Runoff Volume (cf)	Phosphorus Efficiency (%)	Phosphorus Load from Upstream RR Practices (lbs)	Untreated Phosphorus Load to Practice (lbs.)	Phosphorus Removed By Practice (lbs.)	Remaining Phosphorus Load (lbs.)	Downstream Treatment to be Employed
7. Infiltration												
7.a. Infiltration #1 (Spec #8)	lume reduction	0.50	0.00	0	0	0	25	0.00	0.00	0.00	0.00	
	lume reduction	0.50	0.00	0	0	0	25	0.00	0.00	0.00	0.00	
7.b. Infiltration #2 (Spec #8)	lume reduction	0.90	1.00	0	3104	345	25	0.00	2.16	2.00	0.16	
	lume reduction	0.90	1.00	0	719	80	25	0.00	0.50	0.46	0.04	

Total Tv to the BMP includes both the amount of Runoff "reduced" and the remaining volume

Volume Tracking

Residual volume from upstream BMP contributes to next BMP in treatment train for sizing

Practice	on of Credit	Credit	Credit Area (acres)	Volume from Upstream RR Practice (cf)	Runoff Reduction (cf)	Remaining Runoff Volume (cf)	Phosphorus Efficiency (%)	Phosphorus Load from Upstream RR Practices (lbs)	Untreated Phosphorus Load to Practice (lbs.)	Phosphorus Removed By Practice (lbs.)	Remaining Phosphorus Load (lbs.)	Downstream Treatment to be Employed
	olume reduction	0.50	0.00	0	0	0	25	0.00	0.00	0.00	0.00	
7.b. Infiltration #2 (Spec #8)	olume reduction	0.90	1.00	0	3104	345	25	0.00	2.16	2.00	0.16	8.b. ED #2
	olume reduction	0.90	1.00	0	719	80	25	0.00	0.50	0.46	0.04	8.b. ED #2
8. Extended Detention Pond												
8.a. ED #1 (Spec #15)	lume reduction	0.00	0.00	0	0	0	15	0.00	0.00	0.00	0.00	
	lume reduction	0.00	0.00	0	0	0	15	0.00	0.00	0.00	0.00	
8.b. ED #2 (Spec #15)	olume reduction	0.15	1.00	345	569	3224			.16	0.65	1.68	
	olume reduction	0.15	0.00	80	12	68	15		.00	0.01	0.03	



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Load Reduction

Drainage Area B

Drainage Area B Land Cover (acre

	D Soils	Totals	Land Cover Rv
Forest/Open Space (acres)	0.00	0.00	0.00
Managed Turf (acres)	0.00	1.00	0.22
Impervious Cover (acres)	0.00	1.00	0.95
	Total	2.00	

Post Development Treatment Volume (cf) 4247

Apply Runoff Reduction ent Volume & Post-Development Load in Drainage Area B

Practice	on of Credit	Credit	Credit Area (acres)	Volume from Upstream RR Practice (cf)	Runoff Reduction (cf)	Remaining Runoff Volume (cf)	Phosphorus Efficiency (%)	Phosphorus Load from Upstream RR Practices (lbs)	Untreated Phosphorus Load to Practice (lbs.)	Phosphorus Removed By Practice (lbs.)	Remaining Phosphorus Load (lbs.)	Downstream Treatment to be Employed
7. Infiltration												
7.a. Infiltration #1 (Spec #8)	olume reduction	0.50	0.00	0	0	0	25	0.00	0.00	0.00	0.00	
	olume reduction	0.50	0.00	0	0	0	25	0.00	0.00	0.00	0.00	
7.b. Infiltration #2 (Spec #8)	olume reduction	0.90	1.00	0	3104	345	25	0.00	2.16	2.00	0.16	
	olume reduction	0.90	1.00	0	719	80	25	0.00	0.50	0.46	0.04	

{TR: Total Mass Load Efficiency}
={RR Eff. }+ {PR Eff x (1-Rreff)}

{90%}+ {25% x (1-0.90)} = {90+(25*0.1)} = 92.5%

2/2.16 = 92.5%

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Total Removal Efficiency

Stormwater Function	Level 1 Design	Level 2 Design
Annual Runoff Volume Reduction (RR)	50%	90%
Total Phosphorus (TP) EMC Reduction[1] by BMP Treatment Process	25%	25%
Total Phosphorus (TP) Mass Load Removal	63%	93%
Total Nitrogen (TN) EMC Reduction[1] by BMP Treatment Process	15%	15%
Total Nitrogen (TN) Mass Load Removal	57%	92%

Balance of Tv

Load Tracking

Drainage Area B

Drainage Area B Land Cover (acre

	D Soils	Totals	Land Cover Rv
Forest/Open Space (acres)	0.00	0.00	0.00
Managed Turf (acres)	0.00	1.00	0.22
Impervious Cover (acres)	0.00	1.00	0.95
	Total	2.00	

Post Development Treatment Volume (cf) 4247

Apply Runoff Reductionent Volume & Post-Development Load in Drainage Area B

Practice	on of Credit	Credit	Credit Area (acres)	Volume from Upstream RR Practice (cf)	Runoff Reduction (cf)	Remaining Runoff Volume (cf)	Phosphorus Efficiency (%)	Phosphorus Load from Upstream RR Practices (lbs)	Untreated Phosphorus Load to Practice (lbs.)	Phosphorus Removed By Practice (lbs.)	Remaining Phosphorus Load (lbs.)	Downstream Treatment to be Employed
7. Infiltration												
7.a. Infiltration #1 (Spec #8)	olume reduction	0.50	0.00	0	0	0	25	0.00	0.00	0.00	0.00	
	olume reduction	0.50	0.00	0	0	0	25	0.00	0.00	0.00	0.00	
7.b. Infiltration #2 (Spec #8)	olume reduction	0.90	1.00	0	3104	345	25	0.00	2.16	2.00	0.16	
	olume reduction	0.90	1.00	0	719	80	25	0.00	0.50	0.46	0.04	

{Load Delivered to BMP} – {Load Removed by BMP}

= {Remaining P Load (to next BMP or outlet)**}**

Load Tracking

Loading to Next BMP will include:
Residual load from upstream BMPs
+ Additional (direct) untreated load to that BMP

Practice	on of Credit	Credit	Credit Area (acres)	Volume from Upstream RR Practice (cf)	Runoff Reduction (cf)	Remaining Runoff Volume (cf)	Phosphorus Efficiency (%)	Phosphorus Load from Upstream RR Practices (lbs)	Untreated Phosphorus Load to Practice (lbs.)	Phosphorus Removed By Practice (lbs.)	Remaining Phosphorus Load (lbs.)	Downstream Treatment to be Employed
7.a. Infiltration #1 (Spec #8)	olume reduction	0.50	0.00	0	0	0	25	0.00	0.00	0.00	0.00	
7.b. Infiltration #2 (Spec #8)	olume reduction	0.90	1.00	0	3104	345	25	0.00	2.16	2.00	0.16	8.b. ED #2
	olume reduction	0.90	1.00	0	719	80	25	0.00	0.50	0.46	0.04	8.b. ED #2
8. Extended Detention Pond												
8.a. ED #1 (Spec #15)	lume reduction	0.00	0.00	0	0	0	15	0.00	0.00	0.00	0.00	
	lume reduction	0.00	0.00	0	0	0	15	0.00	0.00	0.00	0.00	
8.b. ED #2 (Spec #15)	olume reduction	0.15	1.00	345	569	3224	15	0.16	2.16	0.65	1.68	
	olume reduction	0.15	0.00	80	12	68	15	0.04	0.00	0.01	0.03	

Redevelopment Spreadsheet

- Predevelopment
  - Conditions that exist **at time plans are submitted** for land development of a tract of land
  - Multi-phase projects:
    - Conditions that exist at time of original submission for first phase of project

Development on prior developed land: LDA **DOES NOT** increase impervious cover

LDA ≥ 1 acre	**LDA < 1 acre**
P must be reduced at least **20%** below pre-development P load	P must be reduced at least **10%** below pre-development P load

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Development on prior developed land: LDA **DOES** increase impervious cover

LDA ≥ 1 acre	**LDA < 1 acre**
P load on increased impervious area cannot exceed **0.41 lbs./acre/yr.**	P load on increased impervious area cannot exceed **0.41 lbs./acre/yr.**
P load on remainder of site must be reduced at least **20%** below pre-development P load	P load on remainder of site must be reduced at least **10%** below pre-development P load

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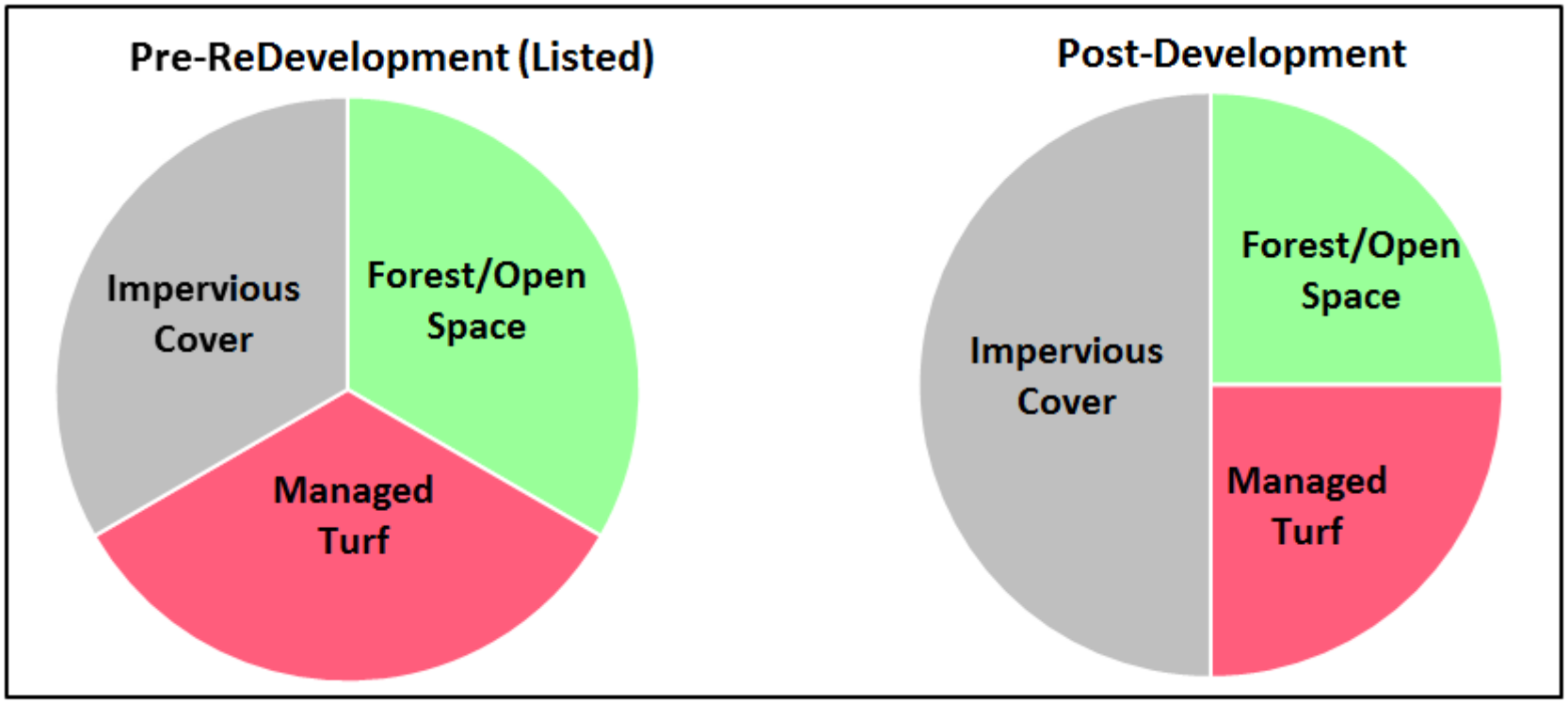

Figure 7. User listed pre-redevelopment and post-development land cover areas.

Source: 2016 Draft VRRM Compliance Spreadsheet Instructions and Documentation, Version 3.0

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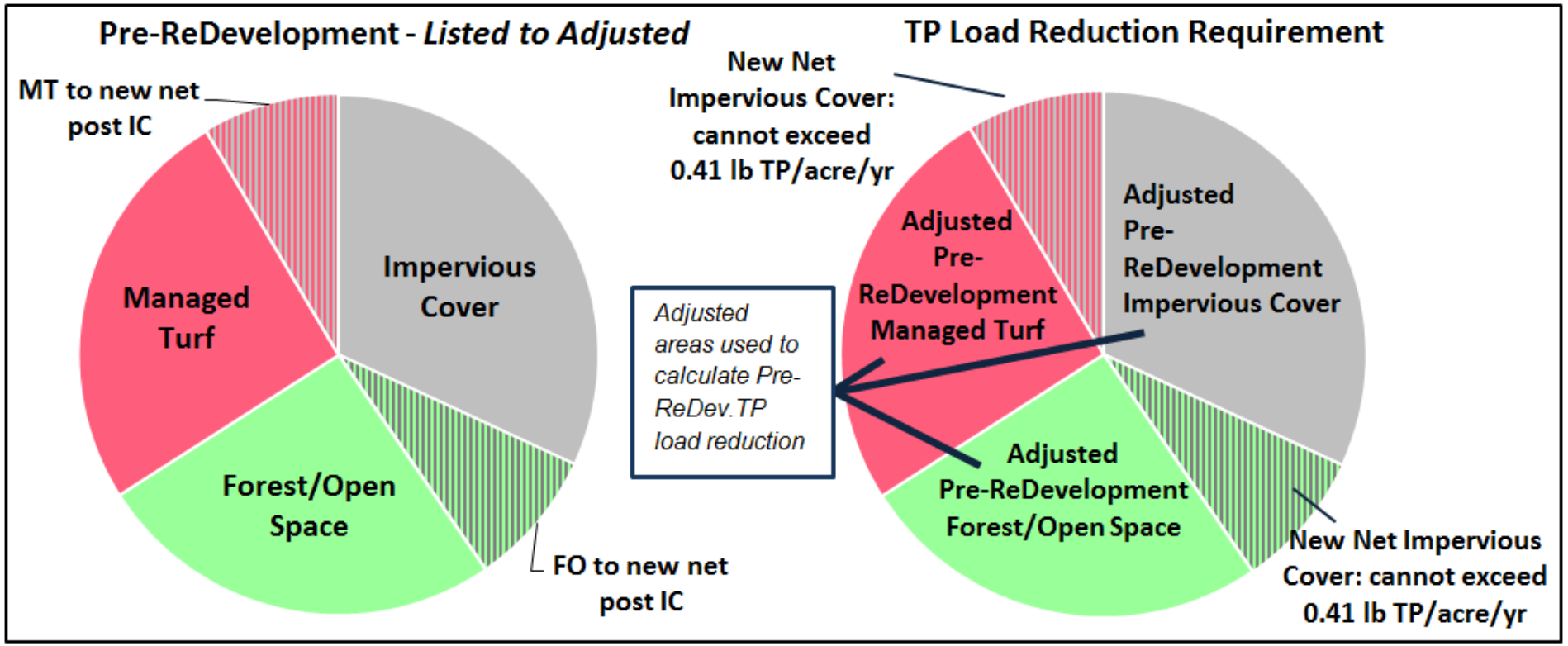

Figure 8. Pre-redevelopment land cover areas showing changes from *Listed* to *Adjusted* spreadsheet land cover areas and applicable TP load reduction requirements

Source: 2016 Draft VRRM Compliance Spreadsheet Instructions and Documentation, Version 3.0

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Redevelopment Spreadsheet Site Data Tab

Post-ReDevelopment Project & Land Cover Information

Total Disturbed Acreage 0.00

Constants

Annual Rainfall (inches)	43
Target Rainfall Event (inches)	1.00
Phosphorus EMC (mg/L)	0.26
Target Phosphorus Target Load (lb/acre/yr)	0.41
Pj	0.90

Nitrogen EMC (mg/L) 1.86

Pre-ReDevelopment Land Cover (acres)

	A soils	B Soils	C Soils	D Soils	Totals
Forest/Open Space (acres) -- undisturbed, protected forest/open space or reforested land	0.00	0.00	0.00	0.00	0.00
Managed Turf (acres) -- disturbed, graded for yards or other turf to be mowed/managed	0.00	0.00	0.00	0.00	0.00
Impervious Cover (acres)	0.00	0.00	0.00	0.00	0.00
				Total	0.00

Post-ReDevelopment Land Cover (acres)

	A soils	B Soils	C Soils	D Soils	Totals
Forest/Open Space (acres) -- undisturbed, protected forest/open space or reforested land	0.00	0.00	0.00	0.00	0.00
Managed Turf (acres) -- disturbed, graded for yards or other turf to be mowed/managed	0.00	0.00	0.00	0.00	0.00
Impervious Cover (acres)	0.00	0.00	0.00	0.00	0.00
				Total	0.00
Area Check	Okay	Okay	Okay	Okay	

Redevelopment – Site Data – Ex 1

Post-ReDevelopment Project & Land Cover Information				Total Disturbed Acreage	1.00
Constants					
Annual Rainfall (inches)	43				
Target Rainfall Event (inches)	1.00				
Phosphorus EMC (mg/L)	0.26			Nitrogen EMC (mg/L)	1.86
Target Phosphorus Target Load (lb/acre/yr)	0.41				
Pj	0.90				

Pre-ReDevelopment Land Cover (acres)	A soils	B Soils	C Soils	D Soils	Totals
Forest/Open Space (acres) -- undisturbed, protected forest/open space or reforested land	0.00	0.00	0.00	0.00	0.00
Managed Turf (acres) -- disturbed, graded for yards or other turf to be mowed/managed	0.00	0.00	2.00	0.00	2.00
Impervious Cover (acres)	0.00	0.00	2.00	0.00	2.00
				Total	4.00

Post-ReDevelopment Land Cover (acres)	A soils	B Soils	C Soils	D Soils	Totals
Forest/Open Space (acres) -- undisturbed, protected forest/open space or reforested land	0.00	0.00	0.00	0.00	0.00
Managed Turf (acres) -- disturbed, graded for yards or other turf to be mowed/managed	0.00	0.00	2.00	0.00	2.00
Impervious Cover (acres)	0.00	0.00	2.00	0.00	2.00
				Total	4.00
Area Check	Okay	Okay	Okay	Okay	

Redevelopment – Site Data – Ex 1

Post-ReDevelopment Project & Land Cover Information

Total Disturbed Acreage 1.00

Constants

Annual Rainfall (inches)	43
Target Rainfall Event (inches)	1.00
Phosphorus EMC (mg/L)	0.26
Target Phosphorus Target Load (lb/acre/yr)	0.41
Pj	0.90

Nitrogen EMC (mg/L) 1.86

Total Site Area (acres)	4.00	4.00
Site Rv	0.59	0.59
Pre-Development Treatment Volume (acre-ft)	0.1950	0.1950
Pre-Development Treatment Volume (cubic feet)	8,494	8,494
Pre-Development Load (TP) (lb/yr)	5.34	5.34

Total ReDev. Site Area (acres)	4.00
ReDev. Site Rv	0.59
Post-ReDevelopment Treatment Volume (acre-ft)	0.1950
Post-ReDevelopment Treatment Volume (cubic feet)	8,494
Post-ReDevelopment Load (TP) (lb/yr)	5.34

Total New Dev. Site Area (acres)	0.00
New Dev. Site Rv	0.95
Post-Development Treatment Volume (acre-ft)	0.0000
Post-Development Treatment Volume (cubic feet)	0
Post-Development Load (TP) (lb/yr)	0.00

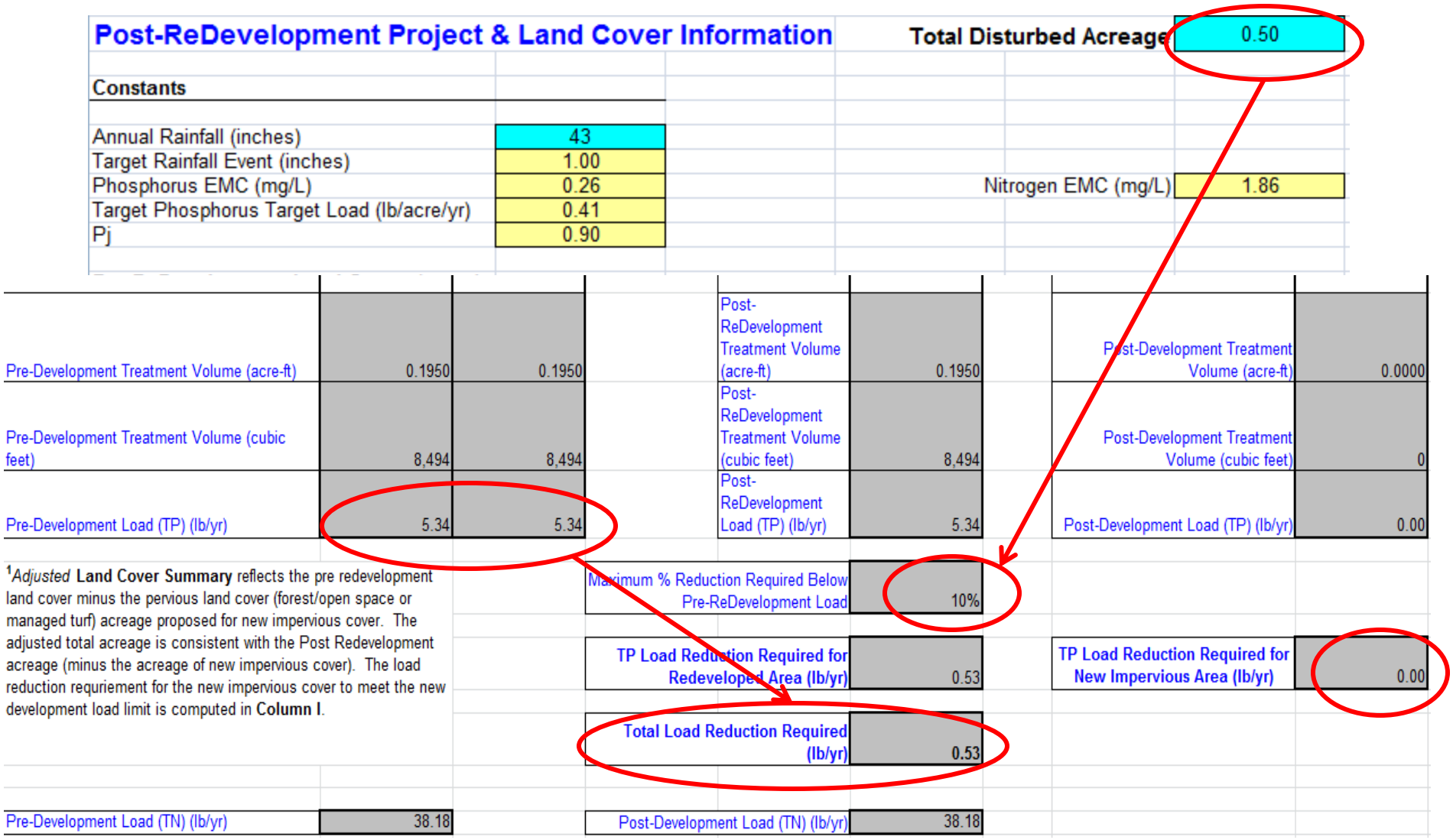
[1]*Adjusted* **Land Cover Summary** reflects the pre redevelopment land cover minus the pervious land cover (forest/open space or managed turf) acreage proposed for new impervious cover. The adjusted total acreage is consistent with the Post Redevelopment acreage (minus the acreage of new impervious cover). The load reduction requriement for the new impervious cover to meet the new development load limit is computed in **Column I**.

Maximum % Reduction Required Below Pre-ReDevelopment Load	20%
TP Load Reduction Required for Redeveloped Area (lb/yr)	1.07
Total Load Reduction Required (lb/yr)	1.07

TP Load Reduction Required for New Impervious Area (lb/yr) 0.00

Pre-Development Load (TN) (lb/yr)	38.18
Post-Development Load (TN) (lb/yr)	38.18

Redevelopment – Site Data – Ex 2



Post-ReDevelopment Project & Land Cover Information

Total Disturbed Acreage 0.50

Constants

Annual Rainfall (inches)	43
Target Rainfall Event (inches)	1.00
Phosphorus EMC (mg/L)	0.26
Target Phosphorus Target Load (lb/acre/yr)	0.41
Pj	0.90

Nitrogen EMC (mg/L) 1.86

Pre-Development Treatment Volume (acre-ft)	0.1950	0.1950
Pre-Development Treatment Volume (cubic feet)	8,494	8,494
Pre-Development Load (TP) (lb/yr)	5.34	5.34

Post-ReDevelopment Treatment Volume (acre-ft)	0.1950
Post-ReDevelopment Treatment Volume (cubic feet)	8,494
Post-ReDevelopment Load (TP) (lb/yr)	5.34

Post-Development Treatment Volume (acre-ft)	0.0000
Post-Development Treatment Volume (cubic feet)	0
Post-Development Load (TP) (lb/yr)	0.00

[1]*Adjusted* **Land Cover Summary** reflects the pre redevelopment land cover minus the pervious land cover (forest/open space or managed turf) acreage proposed for new impervious cover. The adjusted total acreage is consistent with the Post Redevelopment acreage (minus the acreage of new impervious cover). The load reduction requriement for the new impervious cover to meet the new development load limit is computed in **Column I**.

Maximum % Reduction Required Below Pre-ReDevelopment Load	10%
TP Load Reduction Required for Redeveloped Area (lb/yr)	0.53
Total Load Reduction Required (lb/yr)	**0.53**

TP Load Reduction Required for New Impervious Area (lb/yr)	0.00

Pre-Development Load (TN) (lb/yr)	38.18	Post-Development Load (TN) (lb/yr) 38.18

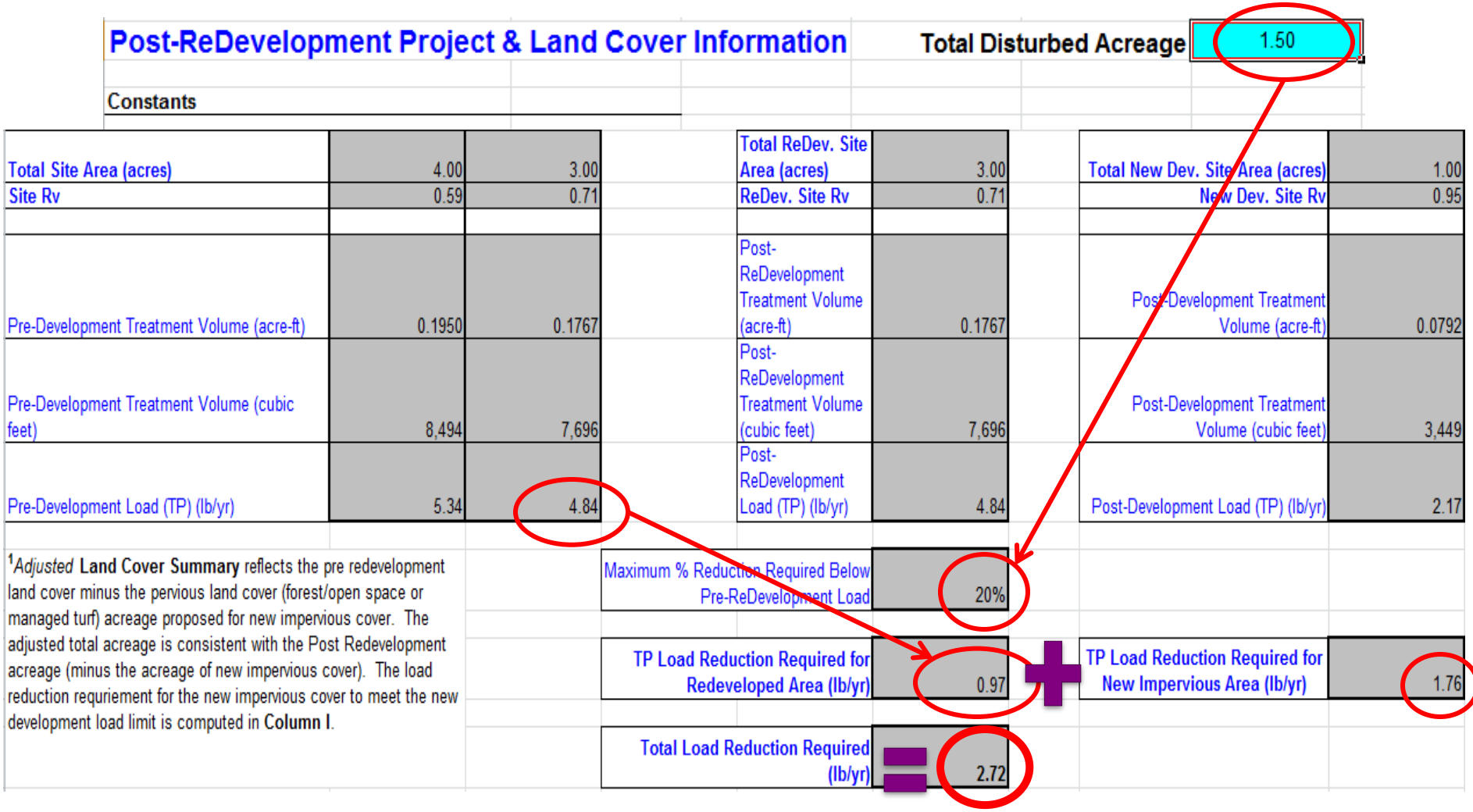
Redevelopment – Site Data – Ex 3

Post-ReDevelopment Project & Land Cover Information				Total Disturbed Acreage	1.50
Constants					
Annual Rainfall (inches)	43				
Target Rainfall Event (inches)	1.00				
Phosphorus EMC (mg/L)	0.26			Nitrogen EMC (mg/L)	1.86
Target Phosphorus Target Load (lb/acre/yr)	0.41				
Pj	0.90				

Pre-ReDevelopment Land Cover (acres)					
	A soils	B Soils	C Soils	D Soils	Totals
Forest/Open Space (acres) -- undisturbed, protected forest/open space or reforested land	0.00	0.00	0.00	0.00	0.00
Managed Turf (acres) -- disturbed, graded for yards or other turf to be mowed/managed	0.00	0.00	2.00	0.00	2.00
Impervious Cover (acres)	0.00	0.00	2.00	0.00	2.00
				Total	4.00

Post-ReDevelopment Land Cover (acres)					
	A soils	B Soils	C Soils	D Soils	Totals
Forest/Open Space (acres) -- undisturbed, protected forest/open space or reforested land	0.00	0.00	0.00	0.00	0.00
Managed Turf (acres) -- disturbed, graded for yards or other turf to be mowed/managed	0.00	0.00	1.00	0.00	1.00
Impervious Cover (acres)	0.00	0.00	3.00	0.00	3.00
				Total	4.00

Redevelopment – Site Data – Ex 3



Post-ReDevelopment Project & Land Cover Information

Total Disturbed Acreage 1.50

Constants

Total Site Area (acres)	4.00	3.00
Site Rv	0.59	0.71
Pre-Development Treatment Volume (acre-ft)	0.1950	0.1767
Pre-Development Treatment Volume (cubic feet)	8,494	7,696
Pre-Development Load (TP) (lb/yr)	5.34	4.84

Total ReDev. Site Area (acres)	3.00
ReDev. Site Rv	0.71
Post-ReDevelopment Treatment Volume (acre-ft)	0.1767
Post-ReDevelopment Treatment Volume (cubic feet)	7,696
Post-ReDevelopment Load (TP) (lb/yr)	4.84

Total New Dev. Site Area (acres)	1.00
New Dev. Site Rv	0.95
Post-Development Treatment Volume (acre-ft)	0.0792
Post-Development Treatment Volume (cubic feet)	3,449
Post-Development Load (TP) (lb/yr)	2.17

[1]*Adjusted* **Land Cover Summary** reflects the pre redevelopment land cover minus the pervious land cover (forest/open space or managed turf) acreage proposed for new impervious cover. The adjusted total acreage is consistent with the Post Redevelopment acreage (minus the acreage of new impervious cover). The load reduction requriement for the new impervious cover to meet the new development load limit is computed in **Column I**.

Maximum % Reduction Required Below Pre-ReDevelopment Load	20%
TP Load Reduction Required for Redeveloped Area (lb/yr)	0.97
TP Load Reduction Required for New Impervious Area (lb/yr)	1.76
Total Load Reduction Required (lb/yr)	2.72

Redevelopment – Site Data – Ex 4

Post-ReDevelopment Project & Land Cover Information				Total Disturbed Acreage	1.50
Constants					
Annual Rainfall (inches)	43				
Target Rainfall Event (inches)	1.00				
Phosphorus EMC (mg/L)	0.26			Nitrogen EMC (mg/L)	1.86
Target Phosphorus Target Load (lb/acre/yr)	0.41				
Pj	0.90				

Pre-ReDevelopment Land Cover (acres)

	A soils	B Soils	C Soils	D Soils	Totals
Forest/Open Space (acres) -- undisturbed, protected forest/open space or reforested land	0.00	0.00	0.00	0.00	0.00
Managed Turf (acres) -- disturbed, graded for yards or other turf to be mowed/managed	0.00	0.00	1.00	0.00	1.00
Impervious Cover (acres)	0.00	0.00	0.50	0.00	0.50
				Total	1.50

Post-ReDevelopment Land Cover (acres)

	A soils	B Soils	C Soils	D Soils	Totals
Forest/Open Space (acres) -- undisturbed, protected forest/open space or reforested land	0.00	0.00	0.00	0.00	0.00
Managed Turf (acres) -- disturbed, graded for yards or other turf to be mowed/managed	0.00	0.00	0.00	0.00	0.00
Impervious Cover (acres)	0.00	0.00	1.50	0.00	1.50
				Total	1.50

Redevelopment – Site Data – Ex 4

Post-ReDevelopment Project & Land Cover Information

Total Disturbed Acreage 1.50

Constants

Total Site Area (acres)	1.50	0.50
Site Rv	0.46	0.95
Pre-Development Treatment Volume (acre-ft)	0.0579	0.0396
Pre-Development Treatment Volume (cubic feet)	2,523	1,724
Pre-Development Load (TP) (lb/yr)	1.59	1.08

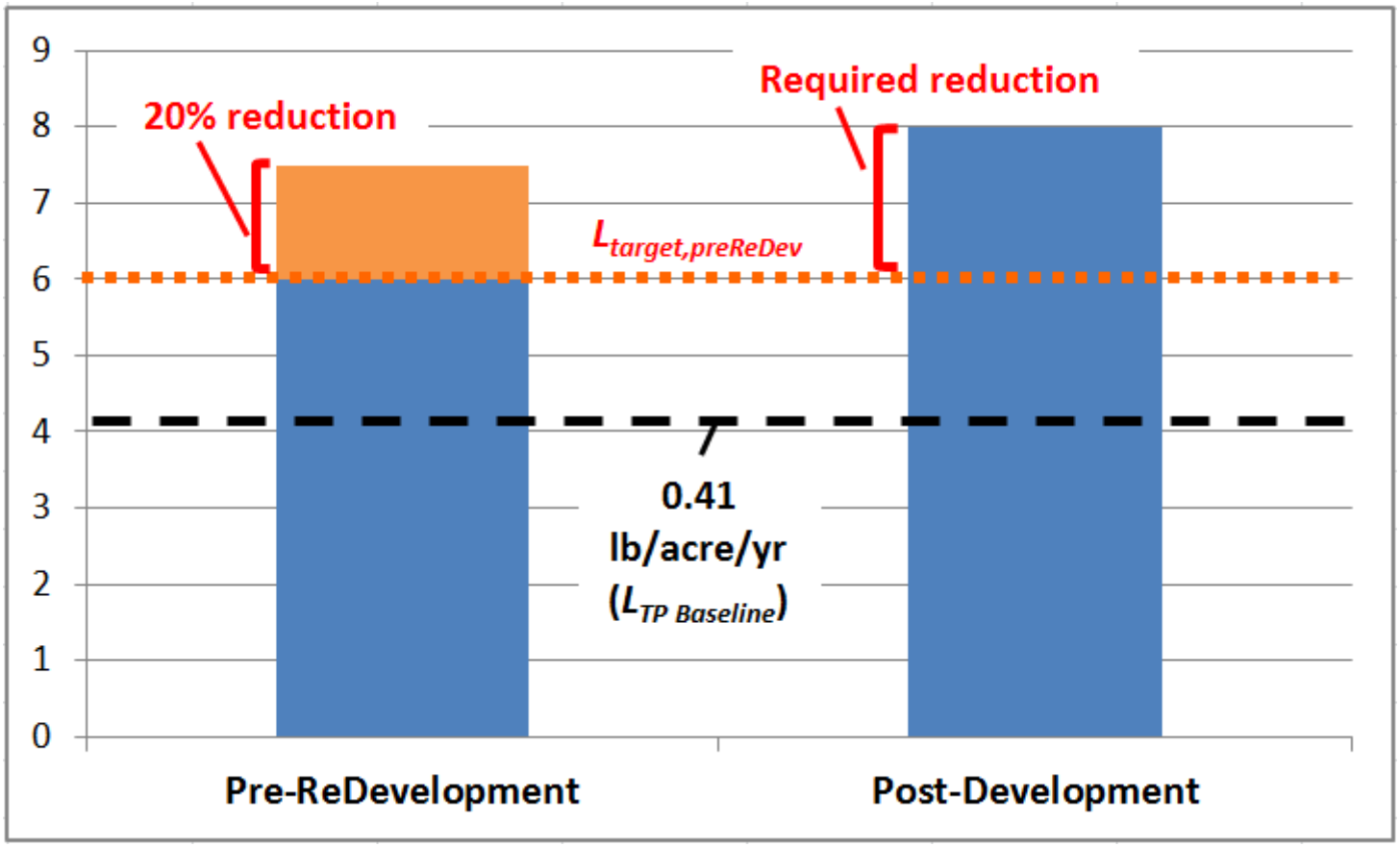
Total ReDev. Site Area (acres)	0.50
ReDev. Site Rv	0.95
Post-ReDevelopment Treatment Volume (acre-ft)	0.0396
Post-ReDevelopment Treatment Volume (cubic feet)	1,724
Post-ReDevelopment Load (TP) (lb/yr)	1.08

Total New Dev. Site Area (acres)	1.00
New Dev. Site Rv	0.95
Post-Development Treatment Volume (acre-ft)	0.0792
Post-Development Treatment Volume (cubic feet)	3,449
Post-Development Load (TP) (lb/yr)	2.17

[1]*Adjusted* **Land Cover Summary** reflects the pre redevelopment land cover minus the pervious land cover (forest/open space or managed turf) acreage proposed for new impervious cover. The adjusted total acreage is consistent with the Post Redevelopment acreage (minus the acreage of new impervious cover). The load reduction requriement for the new impervious cover to meet the new development load limit is computed in **Column I**.

Maximum % Reduction Required Below Pre-ReDevelopment Load	20%
TP Load Reduction Required for Redeveloped Area (lb/yr)	0.22
TP Load Reduction Required for New Impervious Area (lb/yr)	1.76
Total Load Reduction Required (lb/yr)	1.97

Pre-Development Load (TN) (lb/yr)	11.34
Post-Development Load (TN) (lb/yr)	23.25



Source: 2016 Draft VRRM Compliance Spreadsheet Instructions and Documentation, Version 3.0

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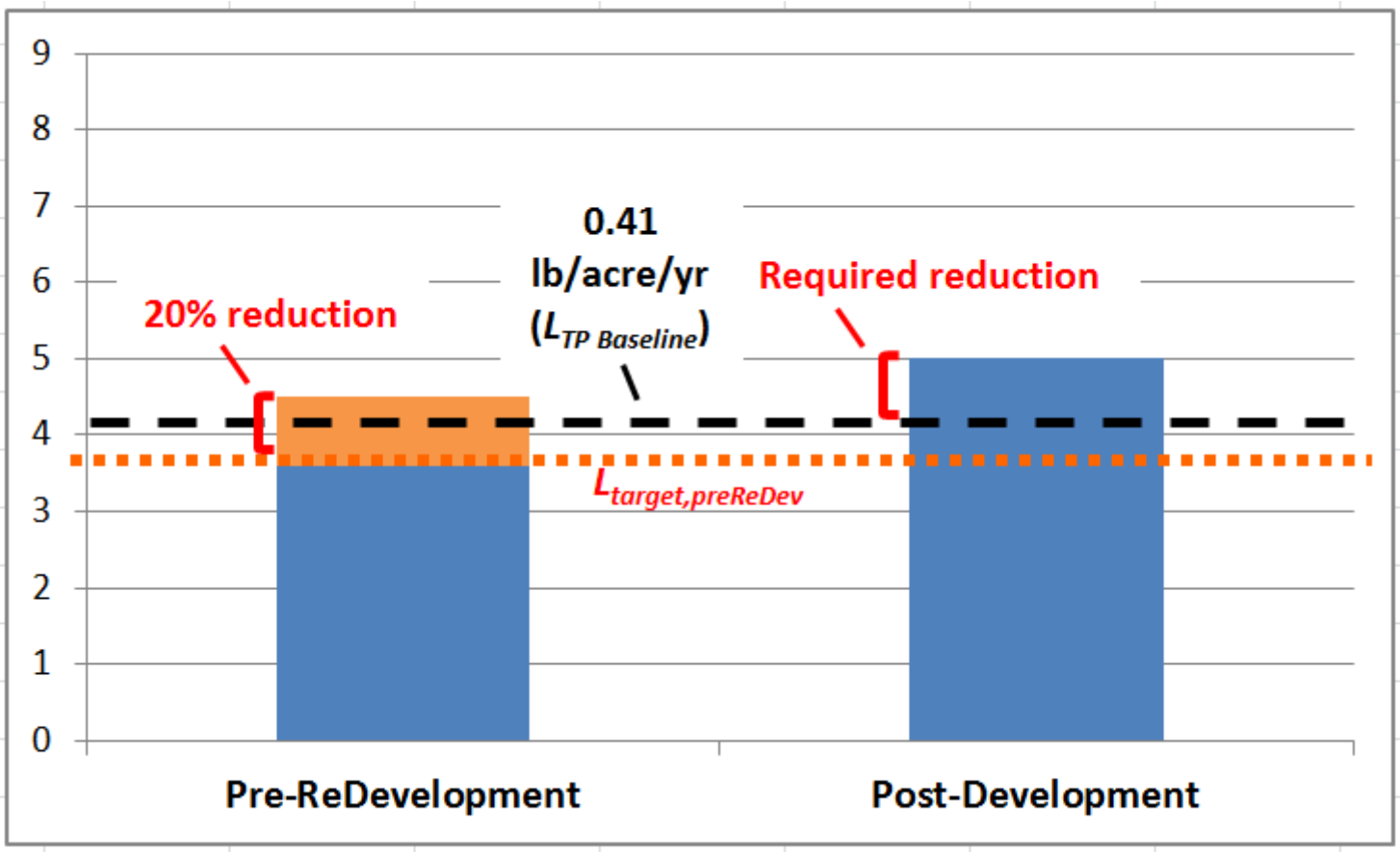

Source: 2016 Draft VRRM Compliance Spreadsheet Instructions and Documentation, Version 3.0

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7b.2 Online vs. Offline Practices and Flow Bypass

- **Offline** – Inlet is the Outlet
- **Bypass Structures** – Pass by higher flows without flow through BMP
- **Why:**
  - Resolve concerns about hydraulic overloading
  - Reduce footprints for BMPs
  - Other constraints (hydraulic/physical/etc.)

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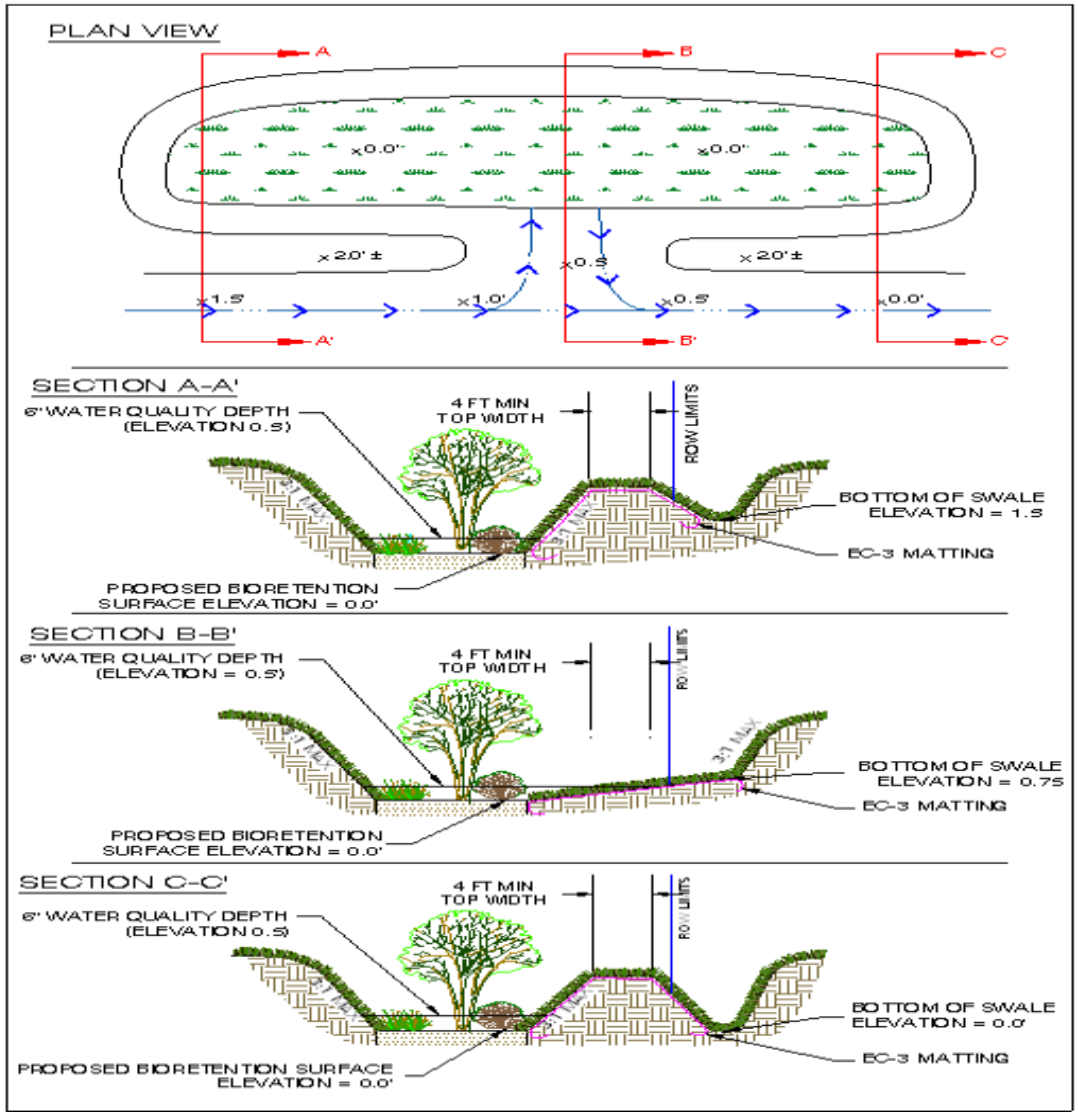
Offline Bioretention



- Depressional (offline) storage
- Flows enter and exit through same opening
- Once practice is “filled” flow continues down normal flow path

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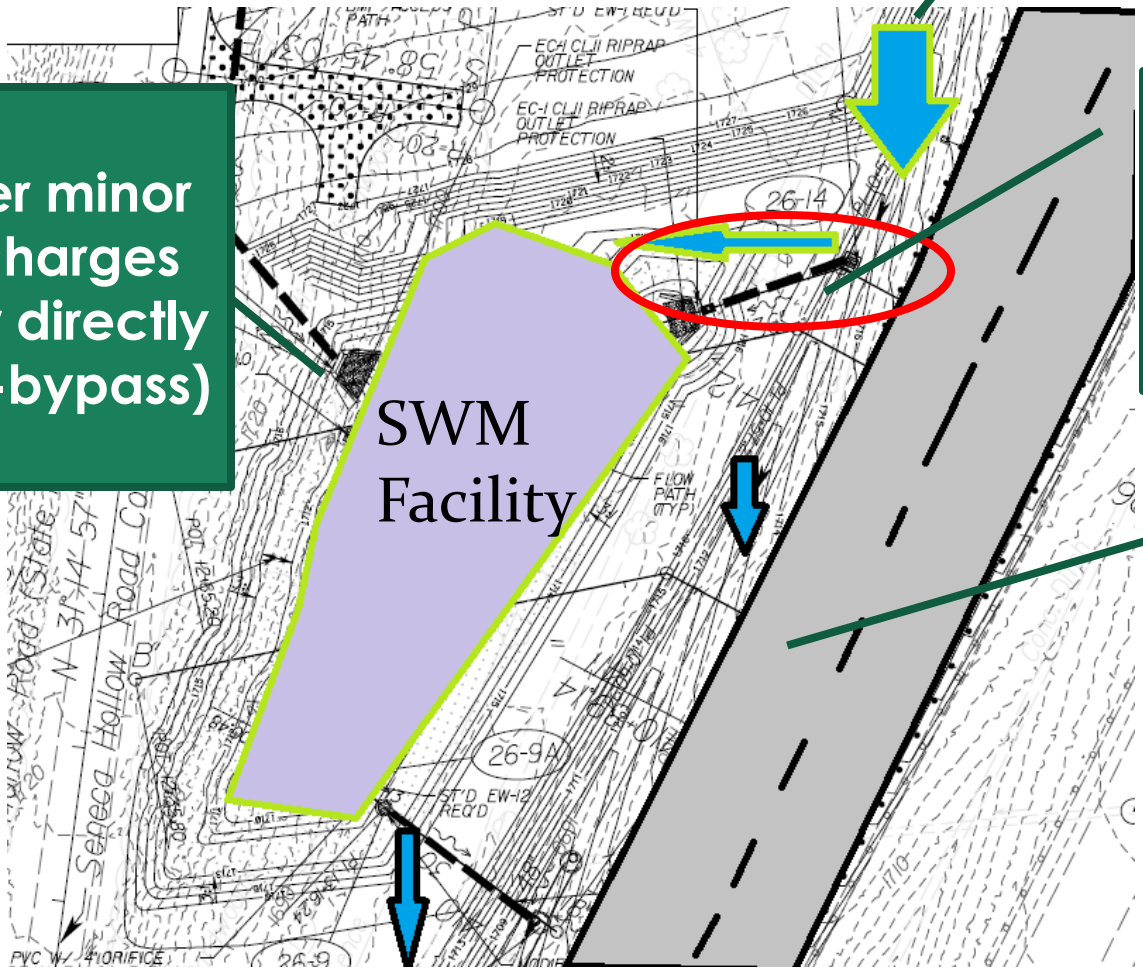
Bypass Structures

Majority of flows enter from ditchline

Other minor discharges enter directly (non-bypass)



Bypass structure directs low flows to stormwater practice

High flows continue on normal flow path in ditchline

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BMP Clearinghouse Specifications

- Published specs (2011) allowed for all Part II B projects
- Pending revisions to specifications
  - Adjust some design parameters based on more current information
  - One specification with change in runoff reduction credit

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Module 7c.

Offsite Compliance Options

Virginia Department of Environmental Quality

Offsite Compliance Options

3. Nonpoint nutrient offset program

- Nutrient credits:
  - Same tributary
  - Same or adjacent 8 digit HUC
  - Outside same or adjacent 8 digit HUC **only if**, *VSMP authority determines credits unavailable within same or adjacent 8 digit HUC (when accepting final site design)*

Offsite Compliance Options

Must be allowed (*for water quality*):

< 5-acres land disturbed

or

Post-construction P control requirement < 10 lbs/year

or

75% required P reductions achieved onsite

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Offsite Compliance Options

75% required P reduction **cannot** be met onsite

Operator must demonstrate:

i. Alternative site designs have been considered that may accommodate on-site BMPs,

ii. On-site BMPs are considered in alternative site designs

iii. Appropriate on-site BMPs will be implemented

iv. Full compliance with postdevelopment P requirements cannot practicably be met on-site

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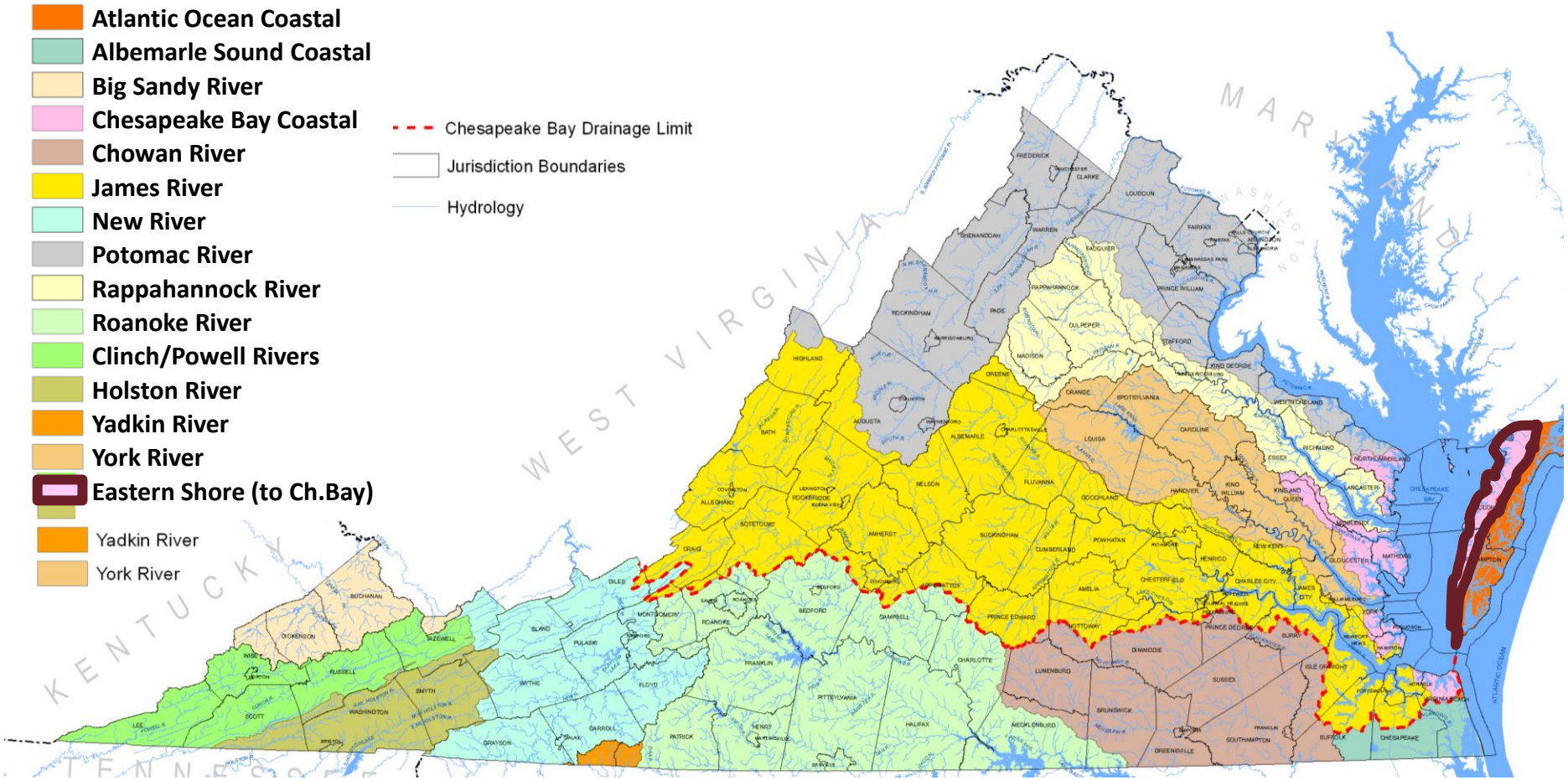
Virginia Tributaries

(§62.1-44.15:35, §62.1-44.19:13)



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Nonpoint Source Nutrient Trading

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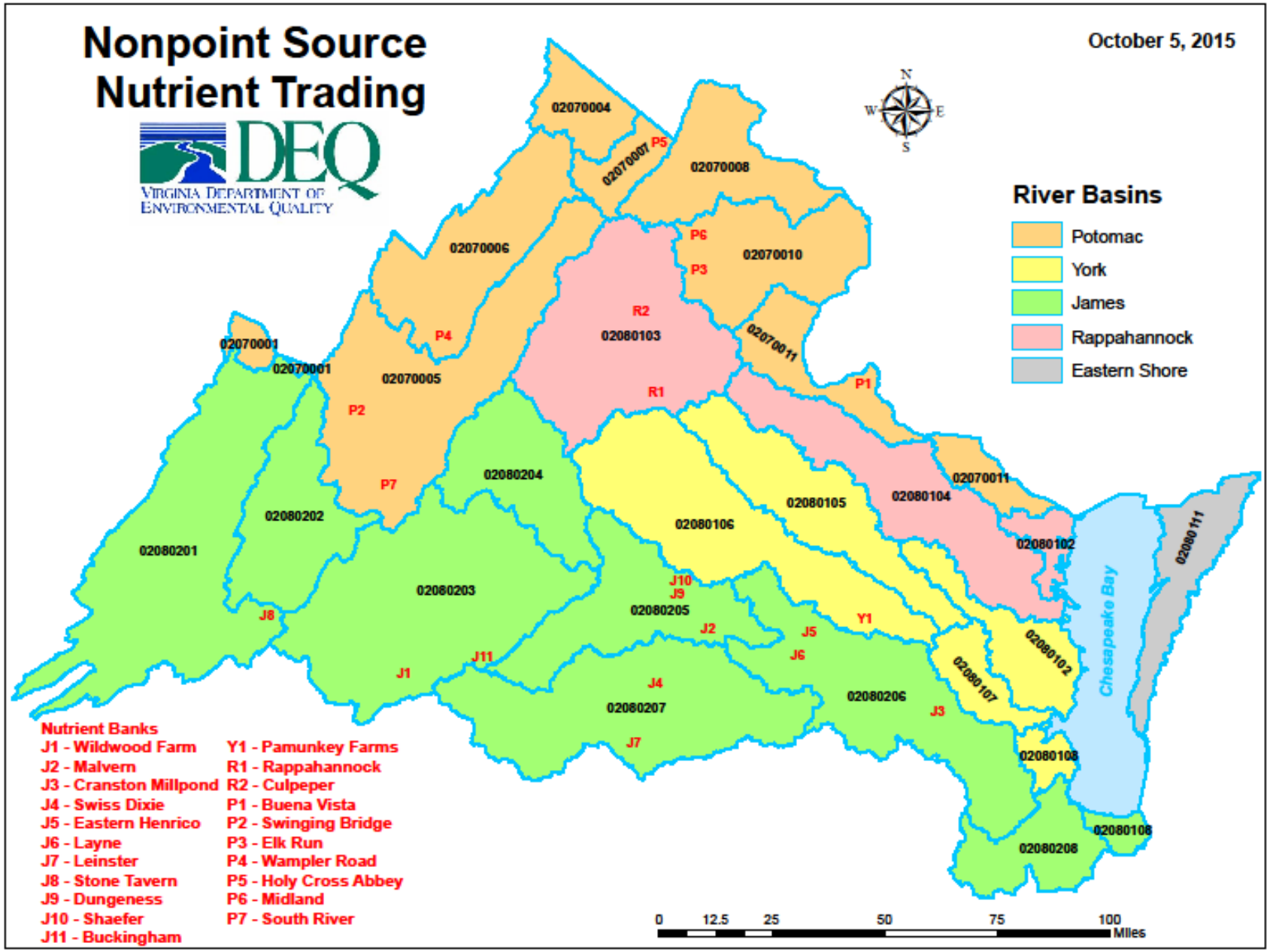
October 5, 2015



Questions?

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